

**ACCORDRYC**

**FRIDAY,  
APRIL 22, 2022  
2:30-5:00 PM  
RICHARD &  
HELEN DEVOS  
FIELDHOUSE**

**21st Annual  
Celebration of Undergraduate  
Research and Creative Activity**

**Photo by Kate Winter '22  
[celebration.hope.edu](http://celebration.hope.edu)**





## Welcome

April 22, 2022

Dear Friends,

I am excited to welcome you to the 21<sup>st</sup> annual Celebration of Undergraduate Research and Creative Activity (CURCA) at Hope College. This event highlights more than two decades of celebrating the scholarly accomplishments of talented Hope students working collaboratively with exceptional faculty mentors in our annual signature research showcase.

Student-faculty collaborative research has long been a hallmark of the Hope College academic program, and it is a distinction that has garnered national recognition. *US News and World Report* ranks Hope College #24 in undergraduate research, among a selective list of 56 colleges and universities, such as Harvard, MIT, Princeton, Stanford, and Yale, who excel in providing outstanding research and creative project opportunities.

Our research-infused courses, ensembles, and studios facilitate students to cultivate meaningful connections with faculty, encourage the development of tangible professional skills for graduate school and postgraduate work, and offer opportunities for enhancing critical thinking and interdisciplinary collaboration. Such experiences are part of what makes a Hope College a transformative and world-class educational experience.

This year's Celebration includes 153 presentations by 252 students from 22 different departments and programs working with 74 faculty mentors. Research occurs both during the academic year and summer, spans the four academic divisions, and includes independent study and course-based research. During the 2021 calendar year, Hope students made 91 conference presentations at off-campus conferences, published 27 articles or scholarly chapters, and submitted another 12 papers for publication. For the 2021 fiscal year, Hope College faculty, staff, and students received \$2.9 million in external funding to support 50 research, outreach, public service, and educational awards.

Thank you for your participation in and support of CURCA 2022. To learn more about student-faculty collaborative scholarship, visit the website: [hope.edu/research](https://hope.edu/research).

Sincerely,

Daryl R. Van Tongeren  
Interim Associate Provost for Academic Affairs

# Celebration of Undergraduate Research and Creative Activity

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## Acknowledgements

Daryl Van Tongeren and Laura McMullen, Celebration Co-directors

Michael Howes, and Events and Conferences Staff

Theo Robert, Shawn Drost, Laura Clarke, and Physical Plant Staff

Andrew Bowen, Kim Pustover, Courtney Teiman, and Creative Dining Services Staff

Paul Willard, Public Affairs and Marketing

Sonja Glover, Digital Media Lab

Tori Longfield and Jeremy Barney, Library

Kristi Rosendahl, Print and Mail Services

Michelle Gibbs, Sustainability Institute

Deb DuMez and Leo Herzog, Computing and Information Technology

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# Celebration of Undergraduate Research and Creative Activity

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## Listing of Projects by Department or Program

Numbers reference the project number on the floor of the event

### Biochemistry & Molecular Biology

Mentors: Drs. Leah Chase & Virginia McDonough

- |     |                                   |   |
|-----|-----------------------------------|---|
| 133 | Natnael Belay, Abigail Gift       | Transcriptional Regulation of <i>OLE1</i> by Cobalt     |
| 134 | Anna Koppin, Sophia Farbarzhevich | Characterization of the K37R Mutation of System $x_c^-$ |

### Biology

Mentors: Drs. Aaron Best, Erika Calvo-Ochoa, Leah Chase, Megan Gall (Vassar College), Natalia Gonzalez-Pech, Laura Hurley (Indiana University), Benjamin Kopek, Jianhua Li, Farrah Madison, Kelly Ronald, Virginia McDonough, Phillip Rivera, and Joseph Stuke

- |     |  |   |
|-----|--|---|
| 117 | Rosemary Mitchell, Leah Van Orman  | Identification of a Potential Fatty Acid Desaturase in the Yeast <i>Schizosaccharomyces pombe</i>   |
| 125 | Abigail Gift, Sarah Stevenson  | Transcriptional Regulation of <i>OLE1</i> in wild type, <i>ino2</i> , <i>ino4</i> , and <i>opi1</i> Mutants in Response to Inositol and Unsaturated Fatty Acids   |
| 126 | Annastasia Petouhoff   | Role of <i>YOR365C</i> , <i>SIP5</i> , <i>YMR141C</i> , <i>RPL13B</i> , and <i>RPS16A</i> in Transcriptional Regulation of <i>OLE1</i> by Unsaturated Fatty Acids |
| 127 | Devin White, Lillian Droscha   | Evaluation of Drinking Water Quality in Peri-urban Zambia   |
| 128 | Natalia Quizena, Ashley Lauraine, Audrey Yellich, Dirk Visser, Emma Rudisel, Hannah Kurncz, Josephine McClure, Maddison Wilder, Mallory Woodbury, Nicholas Figueroa, Thomas Dunn | Genomic Analysis of the Novel F1 Mycobacteriophage Beakin   |
| 129 | Josephine McClure  | Genomic Analysis of the Novel F1 Mycobacteriophage Phalconet  |
| 130 | Jairus Ozara Zebulun Castillo Meer, Ryan Murphy  | Investigation of Mycobacteriophage-host Interactions during Initiation of Phage Infection   |
| 131 | Ryan Murphy, Jairus Meer   | Temperature and Growth Properties of the Broad Host Range K1 Mycobacteriophages   |
| 132 | David Price, Mackenzie Dole, Cameron Parsons   | Do Trees and Shrubs Differ in Lignification? A Case Study on Hazelnuts  |
| 135 | Claire Buck  | Exposure to $H_2O_2$ leads to a change in ubiquitination status of the glutamate/cystine exchanger, System $x_c^-$  |
| 136 | Paulina Kozan  | Evaluating the Impact of Gestational Ethanol Consumption on Adult Immune Function and Addiction-like Behaviors  |
| 137 | Megan Lopez, Claire Baguley  | Cellular Lipids and Viral Replication   |



138	Mikayla Coombs	Insect Innate Immunity and Viral Infection
139	Morgan Sherrard, Suihnem Mawi	Changes in Chromatic Contrast of Avian Plumage in Forests with Different Levels of Deer Browsing
140	Paige Massa, Elianna Sandman, Anders Bogard, Matthew Czmer	Sex Differences in Hormone-modulated Neuroplasticity in the Songbird ( <i>Serinus canarius</i> )
145	Eliese Moelker	Optimization of Protein Precipitation from Human Nails to Facilitate the Early Detection of Mental Health Disorders
146	Nathan Koorndyk	Inflammatory Protein Time of Flight LC/MS
147	Lindsay Jankowski, Molly McLinden, Olivia Sprys-Tellner	The Effects of Iron Oxide Nanoparticles on the Auditory Physiology and Antipredator Behavior in House Sparrows ( <i>Passer domesticus</i> )
148	Linda Nduwimana, Emma Yonker	The Effects of Anthropogenic Disturbances on the Auditory Processing of the House Sparrow ( <i>Passer domesticus</i> )
155	Sarah Grimes, Eliza Lewis	Effects of Urbanization on House Sparrow ( <i>Passer domesticus</i> ) and House Finch ( <i>Haemorhous mexicanus</i> ) Song Propagation
156	Madisyn Kovacs	The Effect of Serotonin on Males' Neural and Behavioral Mechanisms to Female Ultrasonic Vocalizations and Urine in the House Mouse ( <i>Mus musculus</i> )
153	Nathaniel Vorhees, Hannah Gray	Neuroinflammatory and Proliferative Responses during Recovery of the Lesioned Olfactory System of Zebrafish
154	Skylar DeWitt, Evan Thomas	Olfactory Loss and Recovery Following Lesion of the Olfactory Bulb of Zebrafish

## Chemistry

Mentors: Drs. Aaron Best, Meagan Elinski, Jason Gillmore, Natalia Gonzalez-Pech, Jeffrey Johnson, Brent Krueger, and Michael Pikaart

109	Alana Policastro, Halle McGuire	Multifaceted Surface Coatings from Composite Dry Lubrication Schemes
110	Claire Dwyer	Small Scale, Large Impact: The Tribology of Energy Conservation
111	Griffin Gleeson	Nanoparticle Interactions in Cartilage-Mimicking Hydrogels
112	Andrew Reiffer	Synthesis and Characterization of Iron Oxide/Iron Oxide Multifunctional Nanoparticle Collectors
113	Liam Diephuis	The Effect of Agglomeration on Arsenic Absorption onto Iron Oxide Nanomaterials
114	Luke George	Analysis of Iron Oxide Nanoparticle Synthetic Pathway
118	Nicholas Dawson, Jenna Currier, Luke Horsburgh	Microbial Community Composition Dependence on Season, Site, and Flow Rate in the Macatawa Watershed

## Celebration of Undergraduate Research and Creative Activity

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|-----|--|---|
| 119 | Therese Joffre, Luke Shoemaker   | Carbon-Carbon Bond Activation: Optimization of Decarbonylation-Exchange Reactions of Diortho-Fluoro Pyridyl Ketone with Boronic Acids |
| 120 | Grace Stalions   | A Kinetic Study: Mechanism of Rhodium-Catalyzed Decarbonylation   |
| 121 | Eric Salisbury, Joseph Cornell   | Characterizing the Product of Rhodium-Catalyzed Alkene Amidation  |
| 122 | Charlie Michels  | Novel Directing Groups for Metal-Catalyzed Acylation and Decarbonylation Reactions  |
| 123 | Colin Bradley  | Predicting UV-Vis-NIR Absorbance Spectra of Novel Long-Wavelength Azo Dyes  |
| 124 | Madeline Kokmeyer, Thomas Cygan, Claudia Bouma, Alison Bache, Jane DeGroot | Even More Electron-Rich BF <sub>2</sub> -Azo Dyes   |

### Communication

Mentors: Drs. Brandon Boatwright (Clemson University), Sarah Kornfield & Stephanie Pangborn

- |    |                |  |
|----|----------------|--|
| 33 | Caleigh Miller | Frontline Health Heroes? Healthcare Providers' COVID-19 Tweets Suggest Another Story |
| 34 | Rachel Johnson | Poetic Politics: Renewing the Black Jeremiad on the Inaugural Stage                  |

### Computer Science

Mentors: Drs. Charles Cusack, Ryan McFall and Omofolakunmi Olagbemi

- |    |                                  |   |
|----|----------------------------------|---|
| 46 | John VerMeulen III, Kaley Wilson | Tennis Event Detection with Machine Learning                    |
| 47 | Trevor Palmatier                 | Machine Learning Applications using SciKit-Learn and TensorFlow |
| 48 | Adam Czeranko, Dre Solorzano     | Algoraph but in C++   |

### Economics and Business

Mentor: Dr. Sarah Estelle

- |    |            |   |
|----|------------|---|
| 78 | Anna Scott | Does Money Buy Neighborliness? The Effect of Household Income on Neighbor Relationships |
|----|------------|---|



## Education

Mentors: Drs. Jane Finn and Stephen Scogin

- |           |                              |  |
|-----------|------------------------------|--|
| <b>35</b> | Kelsey Corey                 | Compassion Fatigue: Do Special Education Pre-Service Teachers Display Signs?   |
| <b>36</b> | Liliana Olvera, Nolan Kasher | Taking a Different Approach to Drive student's Motivation and Interest in STEM |

## Engineering

Mentors: Drs. Jeffrey Christians, Brook Odle, Courtney Peckens and Katharine Polasek

- |           |  |   |
|-----------|--|---|
| <b>7</b>  | Mason Daleiden                                   | Wireless Sensors for Monitoring Urban Noise   |
| <b>8</b>  | Clara Voskuil                                    | Optimization of Bio-Inspired Control: Four-Story Shear Structure  |
| <b>9</b>  | Valerie Dien                                     | Bio-Inspired Sensing and Actuating Architectures for Feedback Control of Civil Structures   |
| <b>10</b> | Mary C. Ngoma                                    | Exploration of the Use of a Proportional-Integral-Derivative Controller for Mitigation of Seismic Base Excitation in Civil Structures |
| <b>11</b> | Marianna Urdaneta Morillo                        | Modeling Selective Activation of the Median Nerve   |
| <b>12</b> | Sarah Heinowski, Carolyn Atkinson, Peter Ruffolo | Cortical Responses to Physical and Electrically Evoked Somatosensation  |
| <b>13</b> | Josephine Surel, Elizabeth Cutlip                | Exploring Halide Perovskite Structural Tunability to Design Materials for Dynamic Photovoltaic Windows                                |
| <b>14</b> | Rory Campagna                                    | Mechanistically Studying the Degradation of Cesium Lead Iodide Perovskite Phases due to Temperature and Humidity                      |
| <b>15</b> | Jonathan Outen                                   | Understanding the Role of Iodide Vacancy Passivation in Cesium Lead Iodide Perovskite Phase Stability                                 |
| <b>16</b> | James R. Mandeville                              | Manipulating Methylamine Deintercalation in 2D Halide Perovskites via an Organic Spacer   |
| <b>17</b> | Reese Moschetta, Yea Geon Song                   | Feasibility of the Lifting Full-Body Model to Simulate Squatting Tasks  |
| <b>18</b> | Bridget Gagnier                                  | Validating the Use of an IMU-based System to Capture Patient-handling Tasks   |

## English

Mentor: Drs. Curtis Gruenler and Dennis Feaster

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|------------|-------------|----------------------|
| <b>103</b> | Chloe Bartz | Disability in Disney |
|------------|-------------|----------------------|

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## Geological and Environmental Sciences

Mentors: Drs. Brian Bodenbender, Sarah Dean, Jonathan Peterson, and Michael Philben

- |    |                             |  |
|----|-----------------------------|--|
| 25 | Kailey Hoving               | Terrestrial Trash Taphonomy: Characterizing Roadside Litter as Potential Sources of Plastic in Waterways |
| 26 | Kailey Hoving, Garrett Peck | Presence or Absence of Microcystins within the Lake Macatawa Watershed                                   |
| 27 | Rachel Shaw                 | Connecting Chemical Composition and Methane Production in a West Michigan Peatland                       |
| 28 | Lauren Bryan                | Selective Preservation of Structural Carbohydrates during Peat Formation                                 |
| 43 | Charles Soucey              | Investigating Gravity Driven Shale Tectonics: Results from Clay Models                                   |
| 44 | Seth Almquist               | Effects of Drug Adsorption on the Settling of Very Fine Particles in Aqueous Suspensions                 |
| 45 | Grace Behrens               | Carbon Storage and Methane Production from Interdunal Wetlands in Saugatuck Harbor Natural Area          |

## History

Mentors: Dr. Lauren Janes

- |     |                       |   |
|-----|-----------------------|---|
| 106 | Mary Kamara-Hagemeyer | The Liberian Dream: Foundations of Race, Hierarchy, and Freedom in America's Quasi-Colony |
|-----|-----------------------|---|

## Kinesiology

Mentors: Drs. Maureen Dunn, Paula Ferrara, Mark Northuis, Olufemi Oluyedun and Brian Rider

- |    |  |  |
|----|--|--|
| 60 | Natalie Hoffman, Taylor Vines, Mikayla Roman                                   | Examining the Relationship Between Heart Rate and Perceived Exertion during a Division III Women's Basketball Season |
| 61 | Paige Kuhn, Daniel Mauger, Chloe Nedds, Alyssa Potyraj                         | Kohler Effect: 200-Meter Freestyle Performance in Collegiate Swimmers  |
| 62 | Colton Kloote, Dane Christensen, Tyler Koran, Danielle Mitchell, Grant Barrett | Effect of Caffeine Supplementation on Tennis Serve Velocity and Accuracy during Simulated Match Play                 |
| 63 | Anastasia Tucker   | A Biomechanical and Physiological Comparison of the Nike Vaporfly and Nike Zoom Rival D10 Spikes                     |
| 64 | Alyssa Klaver, Anna Cole, Emma Cole, Erin Kloostra, Alison Plasman             | The Psychological and Physical Effects of Power Posing on Running Performance  |
| 65 | Abdiel Cardiel, Holly Ford, Amy Osterbaan, Emily Pena                          | Effects of Mobo Board and Rocker Board Training on the Dynamic Balance of Recreational Runners                       |
| 79 | Natalie Hoffman, Emma Johnson, John Riordan, Lindsay Lane                      | The Comparison of Physiological Demands in Experienced Climbers When Climbing Top Rope Versus Lead Rope              |

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| <b>80</b> | Cody Kalahar, Taemin Kang, Andrea Koh, Madhra Ladewig, Emily Lafnear   | The Relationship between Anthropometry, Upper Body Muscular Strength, and Flexibility with Indoor Bouldering Performance in Novice Climbers |
| <b>81</b> | Jordan Reasoner, Ryan Young, Mary Bailey, Ryan Baek                    | Effects of Yoga-Based Training on Balance in College-Age Students   |
| <b>82</b> | Arinn King, Julia Lalain, Gracie DeVore, Keaton Hamilton, Mical Knafel | Effects of a Four-Week Stretching Program on Shoulder Range of Motion and Throwing Velocity among Collegiate Baseball Players               |
| <b>83</b> | Madison Smith, Isabel Snoap, Addison Panse, Hannah Mitroff             | Validation of the COROS VERTIX Adventure GPS Watch during Exercise of Collegiate Female Soccer Players                                      |
| <b>84</b> | Ryan Flynn   | COVID-19 and Sport: Examining the Role of Leadership on Sport Commitment and Psychological Well-Being                                       |
| <b>85</b> | Julia Dawson, Ryan Flynn, Tyrese Hunt, Lexi Miller                     | The Examination of the Physical and Psychological Impact of Wearable Fitness Trackers on Running Performance in College Athletes            |
| <b>86</b> | Julia Dawson   | Peer Relationships, Social Media Use, and Sport Commitment  |
| <b>87</b> | Meriya Zalma   | Hope4Athletes: Examining Sport Commitment, Motivation and Neuroticism in Collegiate Soccer Players  |

## Mathematics

Mentors: Drs. Darin Stephenson and Brian Yurk

- |           |                |   |
|-----------|----------------|---|
| <b>29</b> | Heleyna Tucker | Automatic Alignment of Remote Imagery for Use in Sand Dune Modeling   |
| <b>30</b> | Blake Harlow   | Constructing Digital Elevation Models from Lake Michigan Dune Imagery |

## Neuroscience

Mentors: Drs. Leah Chase, Paul DeYoung, Andrew Gall, Gerald Griffin, Katharine Polasek and Phillip Rivera

- |            |   |  |
|------------|---|--|
| <b>141</b> | Erick Alvarado, Ayanna Bailey, Sabrina Blank, Lindsey Boltz, Corine LaFrenier, Molly Poel | Exploring the Relationship between Bipolar Disorder, Alcohol Use, and Obsessive Compulsive Disorder in the HCA Animal Model                |
| <b>142</b> | Kelly Bosis   | Early Prenatal Exposure to Homocysteic Acid Leads to Alterations in Behavior and Gene Expression that are Consistent with Bipolar Disorder |
| <b>143</b> | Gabriella Taylor  | Pup Weight at Start of Homocysteic Acid Exposure Alters Behavioral Phenotype of Sprague Dawley Rats  |
| <b>144</b> | Corine LaFrenier, Natalia Quizena   | Understanding the Impact of Chronic Low-Dose GCR Particles on Behavior and Systemic Inflammation in Mice                                   |
| <b>149</b> | Sabrina Blank, Cameron Houck, Grace Gadwood   | The Effects of HSV-1 on Anxiety and Circadian Rhythms  |

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|-----|---|--|
| 150 | Haley Katenin, Alexis Smart, Karsten Galyon                           | Symmetry of Cortical Responses to Physical Touch                           |
| 151 | Emily Lambert, Elizabeth Stevens, Rebekah Miller, Matthew Summerfield | Comparison of Cortical Responses to Physical and Electrically-Evoked Touch |
| 152 | Ceara Donovan, Anna Molloy, Margaret O'Neill                          | An Evaluation of Cortical Response Symmetry to Electrically Evoked Touch   |

## Nursing

Mentors: Drs. Anita Esquerra-Zwiers and Vicki Voskuil

- |    |                                  |  |
|----|----------------------------------|--|
| 41 | Claire Magnuson , Marisa Guidone | Intervention to Support Physical Activity Independence and Routine Everyday: Feasibility of the INSPIRE Pilot Project for Inactive Adolescent Girls          |
| 42 | Marisa Guidone, Claire Magnuson  | Intervention to Support Physical Activity Independence and Routine Everyday: Preliminary Efficacy of the INSPIRE Pilot Project for Inactive Adolescent Girls |
| 59 | Emma West                        | Provision of Maternal Breastmilk in the Neonatal Intensive Care Unit: A Grounded Theory Analysis   |

## Philosophy

Mentor: Dr. Jack Mulder

- |     |                |                                 |
|-----|----------------|---------------------------------|
| 108 | Lydia Harrison | Dimensions of Divine Simplicity |
|-----|----------------|---------------------------------|

## Physics

Mentors: Drs. Paul DeYoung, Peter Gonthier and Zachary Williams

- |    |                 |  |
|----|-----------------|--|
| 5  | Gabriel Balk    | $\beta$ -decay intensity function of $^{54,52}\text{Co}$   |
| 6  | Julie Timperman | Analyzing the Role of Stable Eigenmodes in the Plasma Tearing Instability  |
| 23 | William Vance   | Developing Efficient Algorithms to Compute the Exact Widths of the QED Cyclotron Resonance of Compton Scattering in Strong Magnetic Fields |
| 24 | Kameron Wilcox  | Developing Spin and Polarization Analytical Expressions for Compton Scattering in Strong Magnetic Fields                                   |

## Political Science

Mentors: Drs. Virginia Beard, Annie Dandavati and Jeffrey Polet

- |    |              |   |
|----|--------------|---|
| 3  | Reid Budd    | Unemployment Causes Crime   |
| 4  | Hans Siebert | The Marginalization of America's Working Class                                  |
| 19 | Owen Claar   | Effects of Gun-Control and Gun-Free Zones on the Safety of American Communities |

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<b>20</b>	Elijah Vander Lee	The Effects of Police Funding on Crime Rates and Community Relations
<b>21</b>	Cassidy Folkert	Prison Overcrowding in the U.S.: An Analysis of the Most Incarcerated Nation in the World
<b>22</b>	Corri Zimmerman	Juvenile and Youth Offenders: Delinquency and Recidivism
<b>37</b>	Katelyn DeReus	The Social Context of Populism
<b>38</b>	Valeria Lee	The Dragon and The Condor: Chinese Influence in Chile
<b>39</b>	Olivia Van Ark	China's Mistreatment Of The Uyghur Population
<b>40</b>	Megan Mead	Analysis of United States National Security Policy on Cyberterrorism from China
<b>55</b>	Shane Mast	Geography and Democracy
<b>56</b>	Jonah Badanes-Katzman	States Rights vs. Federal Rights
<b>57</b>	Caleb Smith	The Effects of Foreign Aid
<b>58</b>	Jacob Roman	The Stability of Afghanistan
<b>73</b>	Nathan Penoyar	Does the Type of Electoral System Influence Representation?
<b>74</b>	Andrew Gibson	The Electoral College in the Twenty-First Century
<b>75</b>	Allison Mitchell	Civil Rights and Civil Liberties: Analyzing the Constitutionality of COVID-19 Public Health Mandates
<b>76</b>	Taylor Spanbauer	The Transformation of Media Values and the Impact on U.S. Political Coverage
<b>77</b>	Ryan Ruitter	Protectionism and Recovering Markets
<b>91</b>	James Rupp	Government Regulation on Zoning and Land Use Associated with Affordable Housing, Housing Supply and City Growth in West Michigan
<b>92</b>	Makayla Wilson	Mental Health and Homelessness
<b>93</b>	Noah Hedrick	Global Water Act
<b>94</b>	Garett Shrode	Cycling Infrastructure: Does Benefit Education Affect Warmth Towards Infrastructure Proposals?
<b>95</b>	Luke Rufenacht	The Impact of Educational Attainment on Political Ideology
<b>96</b>	Lily-Kate Pritchard	Analysis of Disability Rights Policy in American Charter Schools

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## Psychology

Mentors: Drs. Carrie Bredow, Alyssa Cheadle, Andrew Gall, Mary Inman, Benjamin Meagher, Lindsey Root Luna, Lauren Slone, Sonja Trent-Brown, and Daryl R. Van Tongeren

- |    |   |   |
|----|---|---|
| 31 | Nina Cuthrell   | Does Knowing Someone Who Has Had Covid Change Your Health Behaviors?  |
| 32 | Samrawit Kelkay   | Impact of Spirituality on Mental Wellbeing during COVID-19  |
| 49 | Brynn Anderson, Kayla Brady, Elliana Hamilton   | There's No Place Like Dorm: Actual-ideal Dorm Ambiance Discrepancy as a Unique Predictor of Psychological Well-being in Undergraduate Students                |
| 50 | Lauren Quillan, Brynn Anderson, Elliana Hamilton, Kayla Brady   | Is It Meant to Be?: Dyadic Effects of Room Ambiance   |
| 51 | Emma Benoit, Erin Vokal, Rebekah Miller   | Visual Mechanisms as a Means to Word Learning   |
| 52 | Aubrey East, Elizabeth Margason, Lars Overos, Nycole Kragt  | Do People Learn Object Names Better When the Object Appears Bigger?   |
| 53 | Zach Wiggins, Ellie Margason  | Does Affirming Privileged Groups Make Them More Sympathetic to Outgroups' Explanations about Racism?  |
| 54 | Dylan Sherman, Demetria Johansen  | Getting by with a Little Help from My Friends: Examining Links among Body Talk and Affirmation in Secular and Religious Settings on Women's Body Satisfaction |
| 66 | Amy Osterbaan   | Health Implications of Deidentifying from Religion for Young Adults   |
| 67 | Taylor Clarke, Jennifer Almquist  | The Influence of Parent Characteristics on Implicit and Explicit Partner Preferences  |
| 68 | David Rende, MacKenna Shampine  | Hope for the Future: Lived Hopes Fulfilled Predict Greater State Hope, Self-Regulation, & Flourishing   |
| 69 | McKenna Bartley, Hannah R Meade, Corine LaFrenier, Elijah H Maxwell, Natalie A Ramsay, Mikenna K Davidson       | Attitudes towards the Outdoors: College Students' Trends before and during the Pandemic Shutdown  |
| 70 | Mikenna Davidson, Natalie Ramsay, Hannah Meade, McKenna Bartley, Corine LaFrenier, Elijah Maxwell, Andrea Rocco | A Retrospective and Prospective Study of Physical Activity and Health Indicators during the COVID-19 Shutdowns: a Holistic Approach                           |
| 71 | Matt Severino, Sabrina Blank, Kirsten Miskowski   | The Psychological Costs of Holding Views with Humility  |
| 72 | Matthew Severino, Kirsten Miskowski, Sabrina Blank, Yuki Kojima   | Exploring Religious Deidentification  |
| 88 | Meriya Zalma, Chloe Swanson, Ayanna Bailey  | Visual Attention across Language Development  |
| 89 | Mikenna Davidson, Natalie Ramsay, Hannah Meade, McKenna Bartley, Corine LaFrenier, Elijah Maxwell, Andrea Rocco | Screen Time and College Students' Mental Health before and during the COVID-19 Shutdowns  |



- 90** Sabrina Blank Forgive and Fall Asleep: Compassionate Reappraisal Leads to Earlier Sleep Onset and Fewer Sleep Disturbances than Rumination

## Religion

Mentor: Dr. Wayne Brouwer

- 107** Lydia Harrison Law and Heart: Studying the Sermons on the Mount and Plain

## Sociology and Social Work

Mentors: Drs. Roger Baumann, Shanna Corner, Dennis Feaster, Aaron Franzen, Rodrigo Serrao, and Elizabeth Sharda

- 97** Merrik Campagna Social Support and Change in Empathy in Undergraduate Pre-Health Students
- 98** Carlie McNiff Stress and Social Support of Foster Parents during COVID-19
- 99** Caroline Daniels Child Labor in Ghana and the Ivory Coast's Cocoa Production: Causes and Efforts to Reduce
- 100** Jared Stephenson, Samuel Brassler, Emily Feaster American Evangelicals, Islam & the Competition for Religious Authority
- 101** Vicente Bickel Privileged Latinx Project: What We Know So Far
- 102** Julia Hopkins Exploration of Language around Ability

## Theatre

Mentors: Reagan Chestnut and Richard Perez

- 104** Emily Dykhoush We Are THE WOLVES: Stage Management for the 2021-22 Theatre Season
- 105** Rachel Scott Stage Manger for Native Gardens

## Celebration of Undergraduate Research and Creative Activity

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51	Benoit, Emma	140	Czmer, Matthew	111	Gleeson, Griffin
101	Bickel, Vicente	7	Daleiden, Mason	153	Gray, Hannah
71, 72, 90, 141, 149	Blank, Sabrina	99	Daniels, Caroline	155	Grimes, Sarah
140	Bogard, Anders	69, 70, 89	Davidson, Mikenna K.	41, 42	Guidone, Marisa
141	Boltz, Lindsey	85, 86	Dawson, Julia	49, 50	Hamilton, Elliana
142	Bosis, Kelly	118	Dawson, Nicholas	82	Hamilton, Keaton
124	Bouma, Claudia	124	DeGroot, Jane	30	Harlow, Blake
123	Bradley, Colin	37	DeReus, Katelyn	107, 108	Harrison, Lydia
49, 50	Brady, Kayla	82	DeVore, Gracie	93	Hedrick, Noah
100	Brasser, Samuel	154	DeWitt, Skylar	12	Heinowski, Sarah
28	Bryan, Lauren	9	Dien, Valerie	60, 79	Hoffman, Natalie
135	Buck, Claire	113	Diephuis, Liam	102	Hopkins, Julia
		132	Dole, Mackenzie	118	Horsburgh, Luke
		152	Donovan, Ceara	149	Houck, Cameron

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25, 26	Hoving, Kailey	69, 70, 89, 141, 144	LaFrenier, Corine	71, 72	Miskowski, Kirsten
85	Hunt, Tyrese	82	Lalain, Julia	75	Mitchell, Allison
147	Jankowski, Lindsay	151	Lambert, Emily	62	Mitchell, Danielle
119	Joffre, Therese	79	Lane, Lindsay	117	Mitchell, Rosemary
54	Johansen, Demetria	128	Lauraine, Ashley	83	Mitroff, Hannah
79	Johnson, Emma	38	Lee, Valeria	145	Moelker, Eliese
34	Johnson, Rachel	155	Lewis, Eliza	152	Molloy, Anna
80	Kalahar, Cody	137	Lopez, Megan	17	Moschetta, Reese
106	Kamara- Hagemeyer, Mary	41, 42	Magnuson, Claire	130, 131	Murphy, Ryan
80	Kang, Taemin	16	Mandeville, James R.	148	Nduwimana, Linda
36	Kasher, Nolan	52, 53	Margason, Elizabeth	61	Nedds, Chloe
150	Katenin, Haley	140	Massa, Paige	10	Ngoma, Mary C.
32	Kelkay, Samrawit	55	Mast, Shane	36	Olvera, Liliana
82	King, Arinn	61	Mauger, Daniel	152	O'Neill, Margaret
64	Klaver, Alyssa	139	Mawi, Suihnem	65, 66	Osterbaan, Amy
64	Kloostra, Erin	69, 70, 89	Maxwell, Elijah H.	15	Outen, Jonathan
62	Kloote, Colton	128, 129	McClure, Josephine	52	Overos, Lars
82	Knafel, Mical	109	McGuire, Halle	47	Palmatier, Trevor
80	Koh, Andrea	147	McLinden, Molly	83	Panse, Addison
72	Kojima, Yuki	98	McNiff, Carlie	132	Parsons, Cameron
124	Kokmeyer, Madeline	40	Mead, Megan	26	Peck, Garrett
146	Koorndyk, Nathan	69, 70, 89	Meade, Hannah R.	65	Pena, Emily
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62	Koran, Tyler	122	Michels, Charlie	126	Petouhoff, Annastasia
156	Kovacs, Madisyn	33	Miller, Caleigh	64	Plasman, Alison
136	Kozan, Paulina	85	Miller, Lexi	141	Poel, Molly
52	Kragt, Nycole	51, 151	Miller, Rebekah	109	Policastro, Alana
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128	Kurncz, Hannah			132	Price, David
80	Ladewig, Madhra			96	Pritchard, Lily-Kate
80	Lafnear, Emily			50	Quillan, Lauren

## Celebration of Undergraduate Research and Creative Activity

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128, 144	Quizena, Natalia	94	Shrode, Garrett	11	Urdaneta Morillo, Marianna
69, 70, 89	Ramsay, Natalie A.	4	Siebert, Hans	39	Van Ark, Olivia
81	Reasoner, Jordan	150	Smart, Alexis	117	Van Orman, Leah
112	Reiffer, Andrew	57	Smith, Caleb	23	Vance, William
68	Rende, David	83	Smith, Madison	20	Vander Lee, Elijah
79	Riordan, John	83	Snoop, Isabel	46	VerMeulen III, John
70, 89	Rocco, Andrea	48	Solorzano, Dre	60	Vines, Taylor
58	Roman, Jacob	17	Song, Yea Geon	128	Visser, Dirk
60	Roman, Mikayla	43	Soucey, Charles	51	Vokal, Erin
128	Rudisel, Emma	76	Spanbauer, Taylor	153	Vorhees, Nathaniel
95	Rufenacht, Luke	147	Sprys-Tellner, Olivia	8	Voskuil, Clara
12	Ruffolo, Peter	120	Stalions, Grace	59	West, Emma
77	Ruiter, Ryan	100	Stephenson, Jared	127	White, Devin
91	Rupp, James	151	Stevens, Elizabeth	53	Wiggins, Zach
121	Salisbury, Eric	125	Stevenson, Sarah	24	Wilcox, Kamaron
140	Sandman, Elianna	151	Summerfield, Matthew	128	Wilder, Maddison
78	Scott, Anna	13	Surel, Josephine	46	Wilson, Kaley
105	Scott, Rachel	88	Swanson, Chloe	92	Wilson, Makayla
71, 72	Severino, Matthew	143	Taylor, Gabriella	128	Woodbury, Mallory
68	Shampine, MacKenna	154	Thomas, Evan	128	Yellich, Audrey
27	Shaw, Rachel	6	Timperman, Julie	148	Yonker, Emma
54	Sherman, Dylan	63	Tucker, Anastasia	81	Young, Ryan
139	Sherrard, Morgan	29	Tucker, Heleyna	87, 88	Zalma, Meriya
119	Shoemaker, Luke			22	Zimmerman, Corri

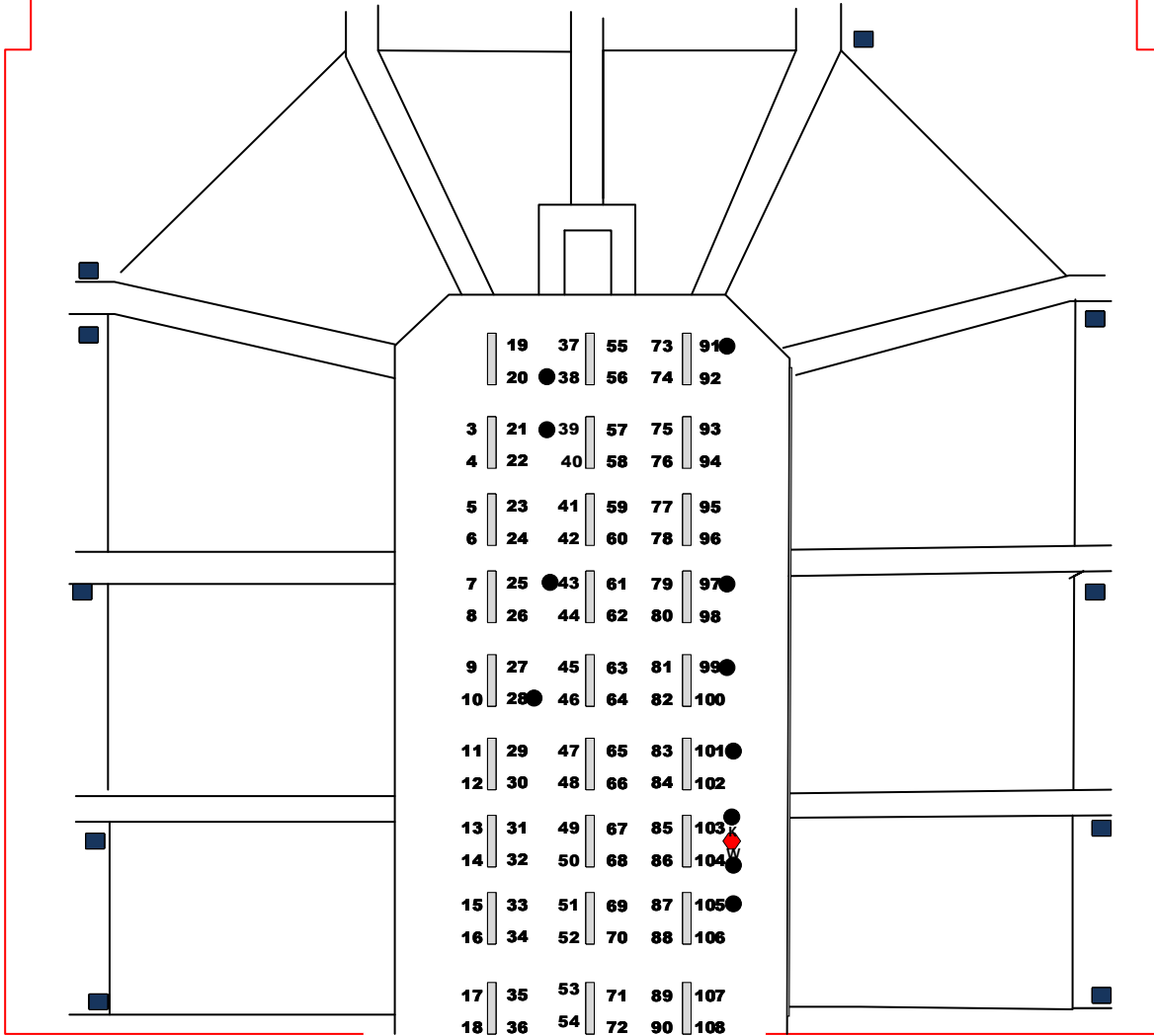
**Celebration of Undergraduate  
Research and Creative Activity  
APRIL 22, 2022**

*East Entrance*

*Upper Concourse*

*Upper Concourse*

*Upper Concourse*



10' x 20'  
Food Tent



109	117	125	133	141	149
110	118	126	134	142	150
111	119	127	135	143	151
112	120	128	136	144	152
113	121	129	137	145	153
114	122	130	138	146	154
123	131	139	147	155	
124	132	140	148	156	

STUDENT  
WELCOME AND  
NAME TAGS



←15ft→



# 21st Annual Celebration of Undergraduate Research and Creative Activity

Poster and Presentation Map

- NATURAL AND APPLIED SCIENCES
- SOCIAL SCIENCES
- ARTS AND HUMANITIES

- 1. Political Science
- 2. Physics
- 3. Nursing
- 4. Engineering
- 5. Geological & Environmental Sci.
- 6. Mathematics
- 7. Computer Science
- 8. Kinesiology
- 9. Economics
- 10. Sociology and Social Work
- 11. Psychology
- 12. Communication
- 13. Education
- 14. English
- 15. Theatre
- 16. History
- 17. Religion
- 18. Philosophy
- 19. Chemistry
- 20. Biology
- 21. Biochemistry
- 22. Neuroscience

